1375.43738X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Jean-Marc SEGUIN et al.

Serial No.: 10/815,804

Filed: April 2, 2005

For: SYSTEM AND METHOD FOR PDA TO PDA COMMUNICATION USING A NETWORK PORTAL

CLAIM FOR PRIORITY

August 25, 2005

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Under the provisions of 35 U.S.C. 119 and 37 CFR 1.55, the applicant(s) hereby claim(s) the right of priority based on:

Great Britain 0307861.5 filed April 4, 2003.

The certified copy of said application is attached hereto.

Respectfully submitted,

Donald E. Stout
Registration No. 26,422
ANTONELLI, TERRY, STOUT & KRAUS, LLP

DES/anp
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Office

INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

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Signed Stephen Hordley

Dated 22 March 2004

Patents Form 7/77

Patents Act 1977
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7/77

Statement of inventorship and of right to grant of a patent

THE PATENT OFFICE
G
- 4 APR 2003
LONDON

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference 1057-0009

2. Patent application number *(if you know it)* 0307861.5

4 APR 2003

3. Full name of the or of each applicant

Mitel Networks Corporation

4. Title of the invention

SYSTEM AND METHOD FOR PDA TO PDA COMMUNICATION USING A NETWORK PORTAL

5. State how the applicant *(s)* derived the right from the inventor *(s)* to be granted a patent

The inventors were at the relevant time employees of the applicant and the applicant is entitled by virtue thereof.

6. How many, if any, additional Patents Forms 7/77 are attached to this form? *(see note (c))* NIL

7. I/We believe that the person *(s)* named over the page *(and on any extra copies of this form)* is/are the inventor *(s)* of the invention which the above patent application relates to.

Signature: IPULSE

Date: 4 April 2003

8. Name and daytime telephone number of person to contact in the United Kingdom David Rickard 020 7223 4979

Notes

a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 08459 500505.

b) Write your answers in capital letters using black ink or you may type them.

c) If there are more than three inventors, please write the names and addresses of the other inventors on the back of another Patents Form 7/77 and attach it to this form.

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e) Once you have filled in the form you must remember to sign and date it.

Enter the full names, addresses and postcodes of the inventors in the boxes and underline the surnames

SEGUIN, Jean-Marc Lucien
10 Cinnabar Way
Stittsville, Ontario
Canada

Patents ADP number *(if you know it)*: 860453000 1

GANCARCIK, Edward Peter
65 Elliott Avenue
Ottawa, Ontario
Canada

Patents ADP number *(if you know it)*: 7288079001

Patents ADP number *(if you know it)*:

Reminder

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Patents Form 1/77

Patents Act 1977
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THE PATENT OFFICE
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The Patent Office

Cardiff Road
Newport
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1. Your reference 1057-0009

- 4 APR 2003

07APR03 E797999-1 C65849
P01/7700 0.00-0307861.5

2. Patent application number *(The Patent Office will fill in this pa*

0307861.5

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Mitel Networks Corporation
350 Legget Drive
Ottawa, Ontario
K2K 2W7 Canada

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation: Canada

8547259001

4. Title of the invention

SYSTEM AND METHOD FOR PDA TO PDA COMMUNICATION USING A NETWORK PORTAL

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

IPULSE
26 Mallinson Road,
London SW11 1BP
UK

Patents ADP number *(if you know it)* 0792953001

7977754001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

YES

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	NIL
Description	6
Claim *(s)*	3
Abstract	1
Drawing *(s)*	5 +5

10. If you are also filing any of the following, state how many against each item.

Priority documents	0
Translations of priority documents	0
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	1
Request for preliminary examination and search *(Patents Form 9/77)*	1
Request for substantive examination *(Patents Form 10/77)*	0
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature: IAN LSE

Date: 4 April 2003

12. Name and daytime telephone number of person to contact in the United Kingdom: David Rickard 020 7223 4979

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SYSTEM AND METHOD FOR PDA TO PDA COMMUNICATION USING A NETWORK PORTAL

Field of the Invention

The present invention relates to portable electronic device communications and in particular to the transfer of information from one portable electronic device to another.

Background of the Invention

Portable electronic devices such as personal digital assistants (PDAs) are commonly used for personal record keeping such as appointments, contacts, expenses and other information. In many instances, it is desirable to transfer information from one portable electronic device to another.

Many portable electronic devices include an infrared (IR) interface for communication with compatible devices, including other portable electronic devices. Thus, these portable electronic devices are operable to send or "beam" information to another device using, for example IrDA, which is a well known protocol using infrared light pulses for data transfer.

IrDA communication suffers from the disadvantage that it is designed for "face to face" transfer of information and is limited to communications within a three-meter line-of-sight range. While this may be acceptable for "face to face" data exchange, the three-meter range is very limiting. When two portable electronic devices cannot be moved within a three-meter line-of-sight range of each other, IrDA communication cannot be effected between the two devices.

Quite apart from portable electronic devices such as PDAs, integrated networks are also known in the art for providing converged voice and data communications using TCP/IP protocol, over Local Area Networks (LANs) and Wide Area Networks (WANs). One such system, the Mitel Networks 3300 Integrated Communications Platform (ICP) delivers sophisticated call management, applications and desktop solutions, including the ability for a PDA user to communicate to a telephone device (i.e. IP telephone) for the

control of call functions. In this case, the telephone device acts as a network portal for passing information such as digits from the PDA's phonebook or contacts database to call control software on the network. From the user's perspective, the PDA controls the telephone device. The PDA communicates with the network via (1) the IrDA interface between the PDA and the telephone device and (2) TCP/IP communication between the telephone device and the network.

It is an object of an aspect of the present invention to extend the known PDA communication functionality of such networks to provide an improved method of communication for portable electronic devices, such as PDAs, over a network.

Summary of the Invention

Therefore, in accordance with an aspect of the present invention there is provided a method and apparatus for allowing two PDAs to "beam" files to one another using a network portal, without the three-meter restriction set forth above. More particularly, a signal path is established between the PDAs via a voice call over a voice communication network. In operation, a first PDA user calls a second PDA user over the voice network to establish the voice call. Then, the voice call path is used to beam files between the two PDAs.

Brief Description of the Drawings

The invention will be better understood with reference to the drawings, and following description, in which:

Fig. 1 is a block diagram showing an exemplary system for PDA to PDA communication using a network portal, according to the present invention;

Figure 2 is a message flow diagram showing call establishment for the system of Figure 1;

Figure 3 is a message flow diagram showing buffered PDA to PDA beaming of data for the system of Figure 1;

Figure 4 is a message flow diagram showing non-buffered PDA to PDA beaming of data for the system of Figure 1; and

Figure 5 is a message flow diagram showing server-mediated PDA to PDA beaming of data according to an alternative embodiment of the invention.

Detailed Description of Preferred and Alternative Embodiments

As shown in Figure 1, an exemplary embodiment of the system according to the present invention comprises two network portals 1 and 3 (e.g. Mitel Network Portal IP telephony devices) connected to respective ICPs 5 and 6 (e.g. Mitel Networks 3100 Integrated Communications Platform). For purposes of illustration, only a single telephony device or network portal is shown connected to each ICP whereas, in fact, there would normally be multiple such devices. Each network portal 1 and 3 supports the IrDA protocol to receive dialing commands from respective PDAs 7 and 9 using OBEX (Object Exchange), which is an application layer at the top of the IrDA protocol stack. Details of this PDA/telephony communication are set forth in Canadian Patent Application No. 2,369383, filed January 25, 2002 and published July 27, 2002.

While the present description is directed to IrDA protocol mechanisms, it will be understood that the present invention is not limited to IrDA protocol and other wireless protocols such as Bluetooth or 802.11, are also possible between phone and mobile device.

The IrDA protocol works on a master/slave basis whereby communications are sent between two devices (such as PDAs 7 and 9). According to the present invention, each network portal 1 and 3 acts as a proxy on behalf of the associated PDA.

LAN A, LAN B and the WAN provide QoS networking/routing in a well known manner, and have no real bearing on the present invention.

With reference to Figure 2, the user of PDA 7 (referred to hereinafter as the Originator) first places a voice call to the user of PDA 9 (referred to hereinafter as the

Destination). Once the call is established, voice communication is effected over IP (RTP/UDP) across LANs A and B and the WAN, between the user's telephony devices 1 and 3.

As shown in Figure 3, when the Originator initiates an object exchange, the network portal 1 accepts the connection on behalf of the Destination. The network portals 1 and 3 at either end communicate their capabilities (mainly, whether they support IrDA transfers). If this is not acknowledged at both ends, PDA to PDA transfer is refused (e.g. a message is displayed on the network portals 1 and 3 and the IrDA connection is closed). Thus, IrDA handshaking determines the capabilities of both devices and establishes the master/slave (primary/secondary in IrDA terms) roles.

When the network portal 1 recognizes an incoming IrDA exchange, a TCP socket is opened to the Destination's network portal 3. The Originator PDA 7 attempts to establish communication to PDA 9 by taking on the role of master (primary) and initiates handshaking with the Destination's PDA 9.

Once connections at both ends have been established and acknowledged, the object is sent by the Originator's PDA 7 (i.e. beaming a file) within the range for a local IrDA exchange, to the Originator's network portal 1. The network portal 1 uses the secondary role of the IrDA stack to handshake with the PDA 7 (exchange IR capabilities for speed, timeouts, etc...). When handshaking completes, the PDA 7 sends the object to the network portal 1 where it is cached. The network portal 1 and PDA 7 then disconnect with a success message.

The Originator's network portal 1 then makes a socket call to the Destination's network portal 3 on a predetermined listening port. Both network portals acknowledge the pending IrDA exchange. The object(s) are packetized by the network portal 1 and then transferred to the Destination's network portal 3 over LAN A, the WAN and LAN B.

When the Destination network portal 3 receives the complete file it uses the primary role of the IrDA stack to detect and initiate handshaking with the Destination's PDA 9. If the PDA 9 is detected, the file is beamed to the PDA 9 and an acknowledgment is returned to the Originating network portal's display during the socket closure.

In some environments, it is possible that the network portal 1 of the preferred embodiment may have insufficient memory to buffer a file before it is sent to the Destination. In such instances, the object can be streamed to the Destination PDA 9 while being received at the Originator's network portal 1.

For example, in the alternative embodiment of Figure 4, the Originator's network portal 1 "stalls" the Originator's PDA 7 by using empty IrDA retransmission frames until the acknowledgement from the Destination network portal 3 that a PDA 9 exists and is connected. As soon as this acknowledgement is received, each subsequently received IrDA frame is transmitted immediately to the Destination network portal 3 and beamed to the PDA 9. Error messages that are within the higher stack layers are returned to the Originator's network portal 1 for re-sending by the PDA 7.

Once the transfer is complete, an acknowledgment is returned to the Originating network portal's display during the socket closure.

For IrDA to operate smoothly without timeout problems, it is necessary for the network portals to "buffer" the incoming request while trying to establish the destination link. Thus, with reference to the alternative embodiment of Figure 5, server mediated transfers can be conducted via a server 11 or "mediator" for accepting, buffering and relaying the object on behalf of either network portal 1 or 3.

During the exchange of IrDA capabilities between the two network portals 1 and 3, the IP address of the mediator 11 is provided by the network portal 1 or 3 that cannot support buffered or streamed data. If both network portals report a mediator, the IP of the mediator from the network portal that originated the voice call is chosen.

In the embodiment of Figure 5, both the Originator and Destination communicate only with the mediator 11. The Originator's network portal 1 transmits the entire file to the mediator 11 which, once the file is received successfully, then relays the file to the Destination network portal 3. Once the Destination network portal 3 successfully delivers the file to the Destination PDA 9, a message is displayed on the Originating network portal 1.

While the embodiments discussed herein are directed to particular implementations of the present invention, it will be apparent that additional variations and modifications to these embodiments are within the scope of the invention as defined solely by the claims appended hereto.

Claims:

1. A method of transferring data over a network from a first portable electronic device to a second portable electronic device comprising the steps of:

initiating a data exchange from one of said first and second portable electronic devices to the other of said first and second portable electronic devices, each of said first and second portable electronic devices including an infrared interface;

sending the data from said one of said first and second portable electronic devices to a first network portal via infrared communication;

sending the data from said first network portal to a second network portal via said network; and

sending the data from said second network portal to said other of said first and second portable electronic devices via infrared communication.

2. A method as claimed in claim 1, further comprising establishing a voice call path between said first network portal and said second network portal for sending said data via said network.

3. A method as claimed in claim 2, wherein said voice communication path is provided over a TCP socket using TCP/IP.

4. A method as claimed in any one of claims 1 to 3, wherein said step of initiating said data exchange includes IrDA handshaking between said one of said portable electronic devices and said first network portal, and said other of said portable electronic devices and said second network portal for determining IrDA capabilities and establishing primary/secondary IrDA roles therebetween.

5. A method as claimed in any one of claims 1 to 4, further comprising the step of buffering said data in said first network portal before sending said data to said second network portal.

6. A method as claimed in any one of claims 1 to 5, wherein said data is streamed to the other one of said portable electronic devices from said first network portal via said second network portal.

7. A method as claimed in claim 6, wherein said first network portal delays the sending of data from said one of said portable electronic devices by using empty IrDA retransmission frames pending receipt of an acknowledgement from said second network portal that said other one of said portable electronic devices is ready to receive said data, whereupon each subsequent IrDA frame of said data sent by said one of said portable electronic devices is transmitted immediately to said second network portal and beamed therefrom to said other one of said portable electronic devices.

8. A method as claimed in any one of claims 1 to 7, wherein said step of sending the data from said first network portal to said second network portal further includes transmitting said data in its entirety from said first network portal to a mediator which in response to receipt of the data relays said data to said second network portal.

9. A system for transferring data over a network from a first portable electronic device to a second portable electronic device comprising:

a first network portal having an infrared interface for receiving said data beamed from said first portable electronic device via infrared communication and in response transmitting said data over the network; and

a second network portal for receiving the data from said network, and beaming said data to said second portable electronic device via a further infrared interface, whereby said data is transferred from said first to said second portable electronic device.

10. A system as claimed in claim 9, wherein said first and second network portals are IP telephony devices for establishing a voice call to transmit said data over the network.

11. A system as claimed in claim 10, wherein said voice call is provided over a TCP socket using TCP/IP.

12. A system as claimed in claim 10 or claim 11, wherein said network includes at least one Integrated Communications Platform connected between said IP telephony devices.

13. A system as claimed in claim 11, wherein each of said first and second network portals supports IrDA protocol for receiving dialing commands from respective ones of said first and second portable electronic device using the OBEX (Object Exchange) application layer at the top of the IrDA protocol stack.

14. A system as claimed in any one of claims 9 to 12, wherein said first network portal includes a cache for buffering the data prior to transmission over said network.

15. A system as claimed in claim 12, wherein said data is streamed to said second portable electronic device from said first network portal via said second network portal.

16. A system as claimed in claim 14, wherein said first network portal includes a cache for buffering said data beamed from said first portable electronic device using empty IrDA retransmission frames pending receipt of an acknowledgement from said second network portal that said second portable electronic device is ready to receive said data, whereupon each IrDA frame of said data sent by said first portable electronic device is transmitted immediately to said second network portal and beamed to said second portable electronic device.

17. A system as claimed in any one of claims 9 to 15, further including a mediator server for receiving said data in its entirety from said first network portal and in response relaying said data to said second network portal.

18. A method as claimed in claim 1 and substantially as hereinbefore described with reference to or as illustrated in the accompanying Figures 1 to 5 inclusive.

19. A system as claimed in claim 9 and substantially as hereinbefore described with reference to or as illustrated in the accompanying Figures 1 to 5 inclusive.

ABSTRACT

A system and method of transferring data over a network from a first portable electronic device to a second portable electronic device, each device including an infrared interface. The method comprises sending the data from the first portable electronic device to a first network portal via infrared communication, sending the data from the first network portal to a second network portal via the network, and sending the data from the second network portal to the second portable electronic device via infrared communication.

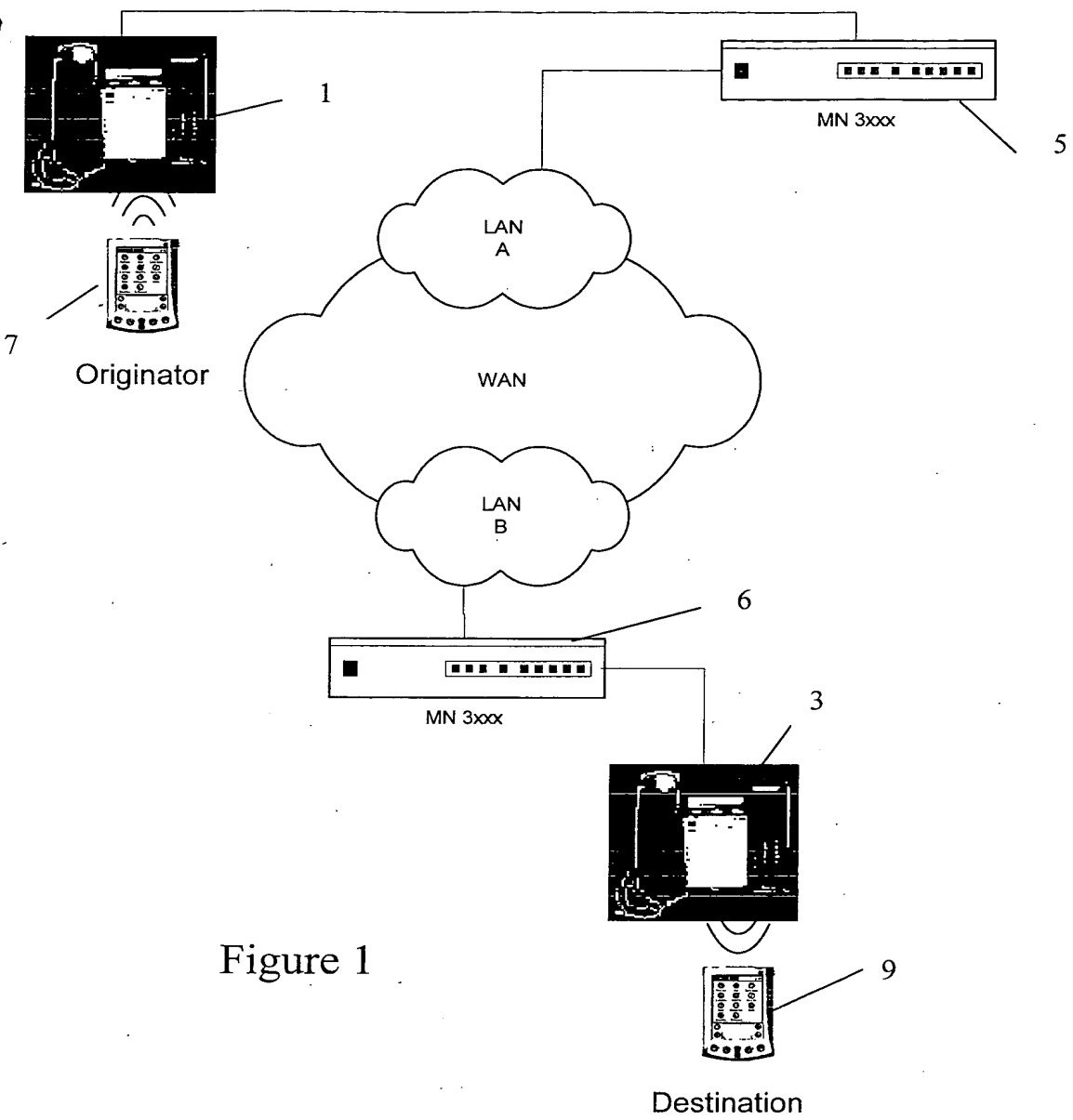
1
MN 3xxx
5
LAN
A
WAN
LAN
B
7
Originator
6
MN 3xxx
3
9
Destination

Figure 1

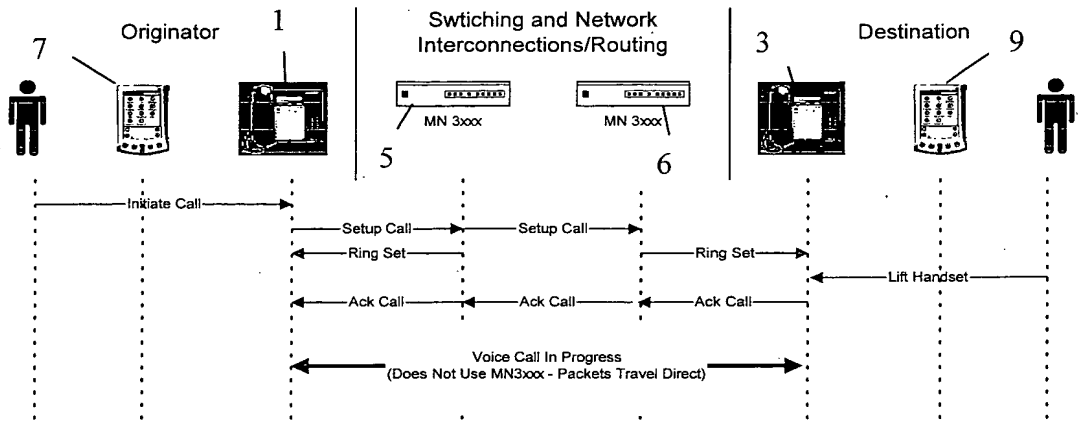
Originator
1
Swtiching and Network
Interconnections/Routing
3
Destination
9
7
MN 3xxx
MN 3xxx
5
6
Initiate Call
Setup Call
Setup Call
Ring Set
Ring Set
Lift Handset
Ack Call
Ack Call
Ack Call
Voice Call In Progress
(Does Not Use MN3xxx - Packets Travel Direct)

Figure 2

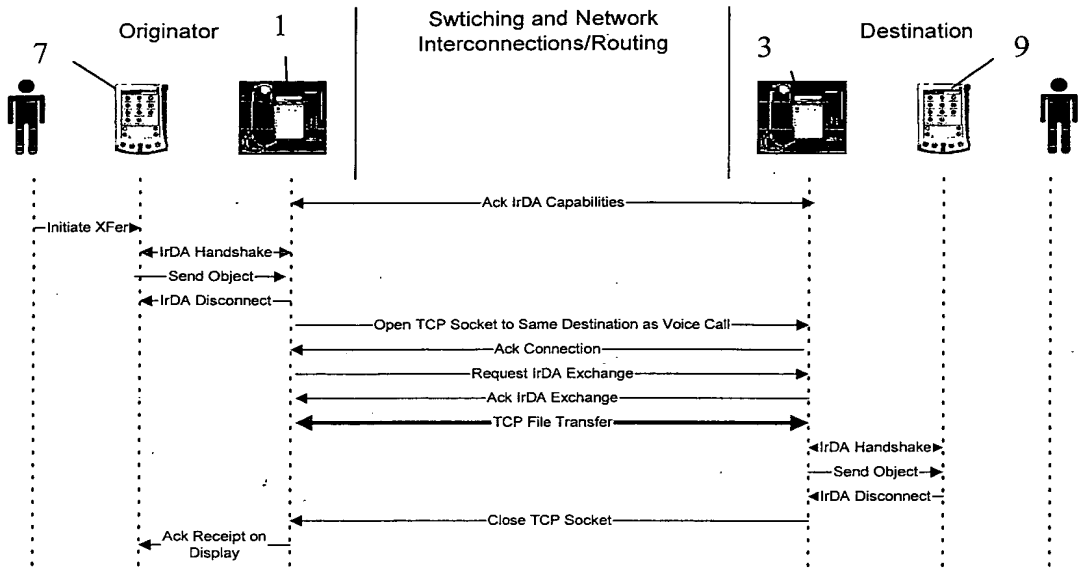
Originator
1
Swtiching and Network
Interconnections/Routing
3
Destination
7
9
Ack IrDA Capabilities
Initiate XFer
IrDA Handshake
Send Object
IrDA Disconnect
Open TCP Socket to Same Destination as Voice Call
Ack Connection
Request IrDA Exchange
Ack IrDA Exchange
TCP File Transfer
IrDA Handshake
Send Object
IrDA Disconnect
Close TCP Socket
Ack Receipt on
Display

Figure 3

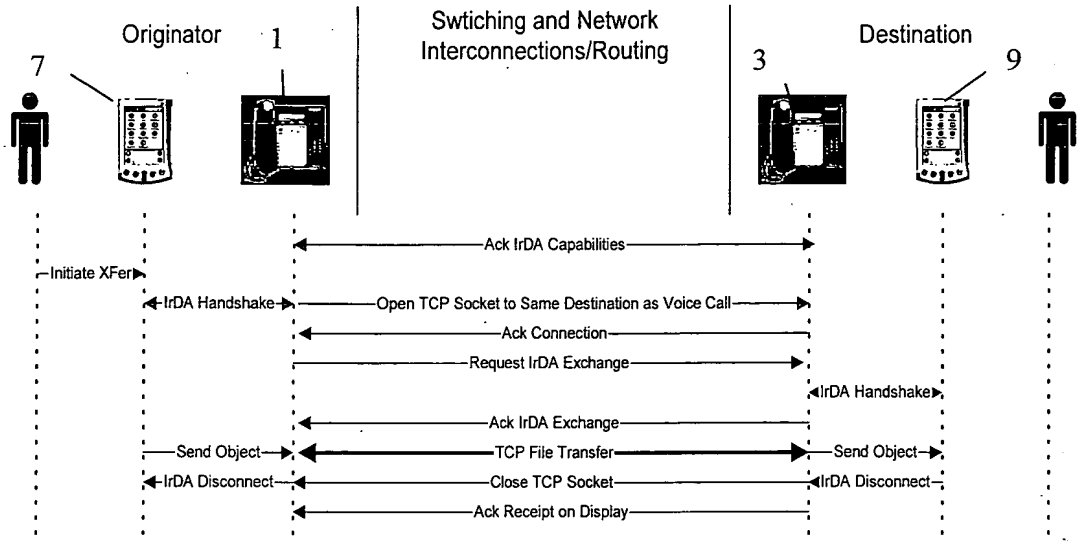
Originator
1
Swtiching and Network
Interconnections/Routing
Destination
7
3
9
Ack IrDA Capabilities
Initiate XFer
IrDA Handshake
Open TCP Socket to Same Destination as Voice Call
Ack Connection
Request IrDA Exchange
IrDA Handshake
Ack IrDA Exchange
Send Object
TCP File Transfer
Send Object
IrDA Disconnect
Close TCP Socket
IrDA Disconnect
Ack Receipt on Display

Figure 4

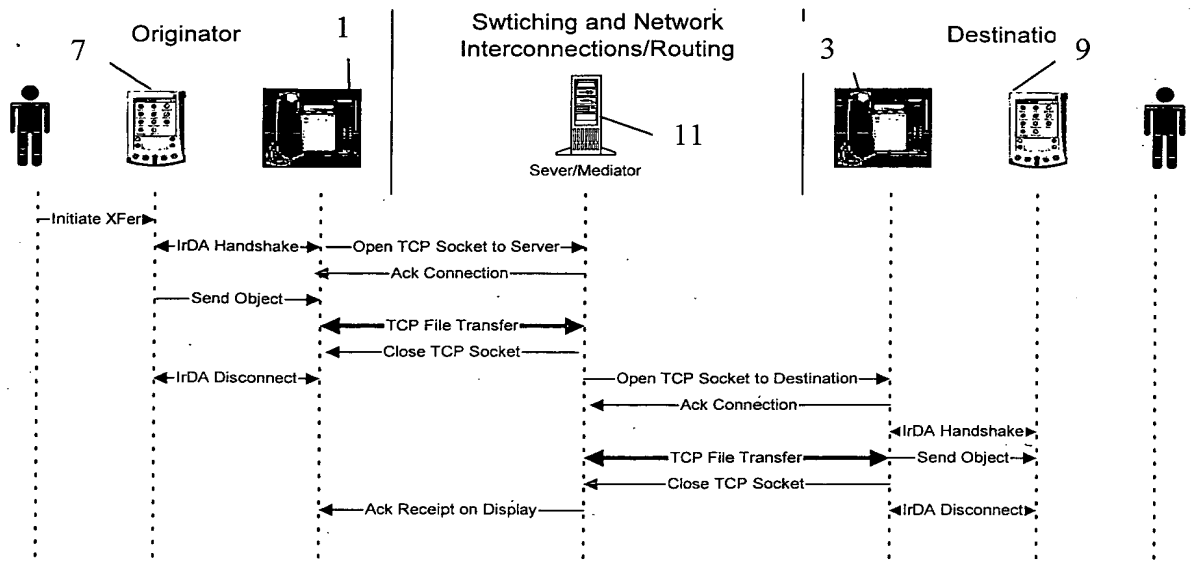
7
Originator
1
Swtiching and Network
Interconnections/Routing
3
Destinatio
9
11
Sever/Mediator
Initiate XFer
IrDA Handshake
Open TCP Socket to Server
Ack Connection
Send Object
TCP File Transfer
Close TCP Socket
IrDA Disconnect
Open TCP Socket to Destination
Ack Connection
IrDA Handshake
TCP File Transfer
Send Object
Close TCP Socket
Ack Receipt on Display
IrDA Disconnect

Figure 5